

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An apparatus for encoding data, the apparatus comprising:

a receiving section that receives the data;

a signal-deteriorating factor generation section ~~for generating~~ configured to generate a signal-deteriorating factor in the received data based on the received data and including a phase-shifting section configured to shift a phase of the received data; and

a data-encoding section ~~for obtaining~~ configured to obtain encoded data by performing encoding processing on the data in which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, the data-encoding section including an encoding section configured to encode, by use of sub-sampling, the data whose phase is shifted by the phase-shifting section.

Claim 2 (Currently Amended): The apparatus for encoding the data according to claim 1, wherein ~~analog data is received at~~

the receiving section is configured to receive analog data,[[;]]

~~wherein~~ the signal-deteriorating factor generation section includes[[;]] an analog-to-digital conversion section ~~for converting~~ configured to convert the analog data received at the receiving section into digital data[[; and]],

[[a]] the phase-shifting section for shifting is configured to shift a phase of digital data output from the analog-to-digital conversion section[[;]], and

~~wherein~~ the encoding section of the data-encoding section is configured to encode ~~data-encoding section has an encoding section for encoding~~ the digital data whose phase is shifted by the phase-shifting section.

Claim 3 (Currently Amended): The apparatus for encoding the data according to claim 2, wherein the analog-to-digital conversion section includes the ~~phase-shifting~~ phase-shifting section, to shift a phase of the digital data when the analog-to-digital conversion section converts the analog data into the digital data.

Claim 4 (Currently Amended): The apparatus for encoding the data according to claim 2, the apparatus further comprising:

a decoding section ~~for decoding~~ configured to decode encoded data output from the encoding section; and

a digital-to-analog conversion section ~~for converting~~ configured to convert the digital data output from the decoding section into analog data.

Claim 5 (Currently Amended): The apparatus for encoding the data according to claim 2, the apparatus further including a recording section ~~for recording~~ configured to record encoded data output from the encoding section on a recording medium.

Claim 6 (Currently Amended): The apparatus for encoding the data according to claim 4, wherein

the digital data is image data, and

~~wherein~~ the apparatus further comprises an image display section ~~for displaying~~ configured to display an image due to analog data output from the digital-to-analog conversion section.

Claim 7 (Currently Amended): The apparatus for encoding the data according to claim 4, wherein

the digital data is audio data, and

~~wherein~~ the apparatus further comprises an audio output section ~~for outputting~~ configured to output an audio due to analog data output from the digital-to-analog conversion section.

Claim 8 (Currently Amended): The apparatus for encoding the data according to claim 2, wherein the phase-shifting section ~~fixes~~ is configured to fix a shift width of a phase of the digital data.

Claim 9 (Currently Amended): The apparatus for encoding the data according to claim 2, wherein the phase-shifting section ~~randomizes~~ is configured to randomize a shift width of a phase of the digital data.

Claim 10 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 2, wherein the encoding section ~~performs~~ is configured to perform encoding by use of sub-sampling on the digital data whose phase is shifted by the phase-shifting section.

Claim 11 (Currently Amended): The apparatus for encoding the data according to claim 2, wherein the encoding section ~~performs~~ is configured to perform conversion encoding on the digital data.

Claim 12 (Currently Amended): The apparatus for encoding the data according to claim 2, wherein the encoding section includes:

an extraction section ~~for extracting~~ configured to extract digital data from a predetermined range of the digital data whose phase is shifted by the phase-shifting section;

a maximum value detection section ~~for detecting~~ configured to detect a maximum value of the digital data extracted by the extraction section;

a minimum value detection section ~~for detecting~~ configured to detect a minimum value of the digital data extracted by the extraction section;

a dynamic range detection section ~~for detecting~~ configured to detect a dynamic range of the digital data extracted by the extraction section, based on the maximum value detected by the maximum value detection section and the minimum value detected by the minimum value detection section;

a generation section ~~for generating~~ configured to generate minimum value-removed data by subtracting the minimum value detected by the minimum value detection section from the digital data extracted by the extraction section; and

a quantization section ~~for quantizing~~ configured to quantize the minimum value-removed data generated by the generation section, by using a quantization step determined in accordance with the dynamic range detected by the dynamic range detection section.

Claim 13 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 12, wherein the quantization section ~~changes the~~ is configured to change a number of quantization bits in accordance with the dynamic range.

Claim 14 (Currently Amended): The apparatus for encoding the data according to claim 2, wherein the encoding section ~~performs~~ is configured to perform data compression encoding on the digital data.

Claim 15 (Currently Amended): The apparatus for encoding the data according to claim 1, wherein

digital data is received at the receiving section[[]],

~~wherein the signal-deteriorating factor generation section includes a phase-shifting section for shifting~~ is configured to shift a phase of the digital data which is received at the receiving section[[]], and

~~wherein the data-encoding section includes an encoding section for encoding~~ is configured to encode the digital data whose phase is shifted by the phase-shifting section.

Claim 16 (Currently Amended): The apparatus for encoding the data according to claim 15, further comprising:

a decoding section ~~for decoding~~ configured to decode encoded data output from the encoding section; and

a digital-to-analog conversion section ~~for converting the~~ configured to convert digital data output from the decoding section into analog data.

Claim 17 (Currently Amended): The apparatus for encoding the data according to claim 1, wherein ~~digital data is received at~~

the receiving section is configured to receive digital data[[]],

~~wherein the data-encoding section includes the signal-deteriorating factor generation section~~[[]],

~~wherein~~ the data-encoding section includes:

a first encoding section ~~for encoding~~ configured to encode the digital data which is received at the receiving section;

a second encoding section ~~[[for]]~~ configured to further encode the digital data encoded by the first encoding section; and

a third encoding section ~~[[for]]~~ configured to further encode the digital data encoded by the second encoding section~~[[;]]~~, and

~~wherein~~ output data of the first encoding section, the second encoding section, and the third encoding section is deteriorated because the digital data which is received at the receiving section is shifted in phase.

Claim 18 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 17, wherein

the first encoding section ~~performs~~ is configured to perform encoding by use of sub-sampling on the digital data~~[[;]]~~, and

~~wherein~~ the second encoding section includes:

an extraction section ~~for extracting~~ configured to extract digital data from a predetermined range of the digital data encoded by the first encoding section;

a maximum value detection section ~~for detecting~~ configured to detect a maximum value of the digital data extracted by the extraction section;

a minimum value detection section ~~for detecting~~ configured to detect a minimum value of the digital data extracted by the extraction section;

a dynamic range detection section ~~for detecting~~ configured to detect a dynamic range of the digital data extracted by the extraction section, based on the maximum value

detected by the maximum value detection section and the minimum value detected by the minimum value detection section;

a generation section ~~for generating~~ configured to generate minimum value-removed data by subtracting the minimum value detected by the minimum value detection section from the digital data extracted by the extraction section; and

a quantization section ~~for quantizing the~~ configured to quantize minimum value-removed data generated by the generation section, by using a quantization step determined in accordance with the dynamic range detected by the dynamic range detection section.

Claim 19 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 18, wherein the third encoding section ~~performs~~ is configured to perform conversion encoding on the digital data.

Claim 20 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 1, wherein

~~digital data is received at the receiving section~~ is configured to receive digital data;  
~~wherein~~ the signal-deteriorating factor generation section includes a first encoding section ~~for performing~~ configured to perform encoding by use of sub-sampling on the digital data which is received at the receiving section~~[[;]]~~, and

~~wherein~~ the data-encoding section includes a second encoding section ~~for performing~~ configured to perform conversion encoding on the digital data encoded by the first encoding section.

Claim 21 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 20, wherein

the digital data is image data $[[;]]_1$  and

~~wherein~~ the first encoding section ~~performs~~ is configured to perform line offset sub-sampling and to alternately arrange ~~arranges~~, for each two consecutive lines, pixel data constituting digital data that corresponds to the two lines, to create new digital data.

Claim 22 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 1, wherein ~~digital data is received at~~

the receiving section $[[;]]$  is configured to receive digital data,

~~wherein~~ the signal-deteriorating factor generation section includes a first encoding section ~~for performing~~ configured to perform encoding by use of sub-sampling on the digital data which is received at the receiving section $[[;]]_1$ ,

~~wherein~~ the data-encoding section includes a second encoding section  $[[for]]$  configured to further encode ~~encoding~~ the digital data encoded by the first encoding section $[[;]]_1$  and

~~wherein~~ the second encoding section includes:

an extraction section ~~for extracting~~ configured to extract digital data from a predetermined range of the digital data encoded by the first encoding section;

a maximum value detection section ~~for detecting~~ configured to detect a maximum value of the digital data extracted by the extraction section;

a minimum value detection section ~~for detecting~~ configured to detect a minimum value of the digital data extracted by the extraction section;

a dynamic range detection section ~~for detecting~~ configured to detect a dynamic range of the digital data extracted by the extraction section, based on the maximum value



detected by the maximum value detection section and the minimum value detected by the minimum value detection section;

a generation section ~~for generating~~ configured to generate minimum value-removed data by subtracting the minimum value detected by the minimum value detection section from the digital data extracted by the extraction section; and

a quantization section ~~for quantizing~~ configured to quantize the minimum value-removed data generated by the generation section, by using a quantization step determined in accordance with the dynamic range detected by the dynamic range detection section.

Claim 23 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 22, wherein

the digital data is image data $[[;]]_s$  and

~~wherein~~ the first encoding section ~~performs~~ is configured to perform line offset sub-sampling and to alternately arrange ~~arranges~~, for each two consecutive lines, pixel data constituting digital data that corresponds to the two lines, to create new digital data.

Claim 24 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 1, wherein ~~digital signal is received at the receiving section $[[;]]$~~  is configured to receive a digital signal,

~~wherein~~ the signal-deteriorating factor generation section includes a blocking section ~~for performing~~ configured to perform blocking on the received digital signal accompanied by shuffling in such a predetermined pattern as to reduce a correlation between adjacent items of data $[[;]]_s$  and

~~wherein~~ the data-encoding section includes a block-encoding section ~~for obtaining~~ configured to obtain an encoded digital signal by performing block encoding on data of each of the blocks obtained by the blocking section.

Claim 25 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 24, wherein the block-encoding section includes:

an orthogonal transformation section ~~for obtaining~~ configured to obtain a conversion coefficient by performing orthogonal transformation on the data of each of the blocks obtained by the blocking section; and

a quantization section ~~for quantizing~~ configured to quantize the conversion coefficient of each of the blocks from the orthogonal transformation section.

Claim 26 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 24, wherein the block-encoding section includes:

a maximum value/minimum value detection section ~~for detecting~~ configured to detect a maximum value and a minimum value of data in a block;

a dynamic range detection section ~~for detecting~~ configured to detect a dynamic range of the data in the block according to the maximum value and the minimum value detected by the maximum value/minimum value detection section;

a generation section ~~for generating~~ configured to generate minimum value-removed data by subtracting the minimum value detected by the maximum value/minimum value detection section from the data in the block; and

a quantization section ~~for obtaining~~ configured to obtain an encoded digital signal by quantizing the minimum value-removed data generated by the generation section, by using a

quantization step determined in accordance with the dynamic range detected by the dynamic range detection section.

Claim 27 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 1, further comprising

an extraction section ~~for extracting~~ configured to extract data from a predetermined range of the data received at the receiving section, wherein

~~wherein~~ the data-encoding section includes:

a maximum value/minimum value detection section ~~for detecting~~ configured to detect a maximum value and a minimum value of the data extracted by the extraction section;

a dynamic range detection section ~~for detecting~~ configured to detect a dynamic range of the data extracted by the extraction section, according to the maximum value and the minimum value detected by the maximum value/minimum value detection section;

a generation section ~~for generating~~ configured to generate minimum value-removed data by subtracting the minimum value detected by the maximum value/minimum value detection section from the data extracted by the extraction section; and

an encoding section ~~for obtaining~~ configured to obtain encoded data by quantizing the minimum value-removed data generated by the generation section, by using a quantization step determined in accordance with the dynamic range detected by the dynamic range detection section, and

~~wherein~~ the encoding section includes the signal-deteriorating factor generation section ~~for performing~~ configured to perform quantization in a condition where a quantization step in at least one of a region on the side of the maximum value and a region on the side of the minimum value is made larger than quantization steps in other regions.

Claim 28 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 27, wherein the encoding section ~~changes the~~ is configured to change a number of quantization bits according to the dynamic range.

Claim 29 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 27, further including a number-of-times detection section ~~for detecting~~ configured to detect a number of times of a maximum value side, which is the number of items of data contained in a predetermined range on the maximum value side, and a number of times of a minimum value side, which is the number of items of data contained in a predetermined range on the minimum value side, based on the data extracted by the extraction section, wherein

~~wherein~~ the encoding section ~~makes~~ is configured to make a quantization step in the region on the minimum value side larger than quantization steps in other regions if the number of times of the minimum value side is smaller than the number of times of the maximum value side or makes the quantization step in the region on the maximum value side larger than quantization steps in other regions if the number of times of the maximum value side is smaller than the number of times of minimum value side.

Claim 30 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 27, further including a decoding section ~~for decoding~~ configured to decode the encoded data obtained by the encoding section, and a digital-to-analog conversion section ~~for converting~~ configured to convert digital data output from the decoding section into analog data.

Claim 31 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 27, further including a recording section ~~for recording the~~ configured to record encoded data output from the encoding section on a recording medium.

Claim 32 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 30, wherein

analog data output from the digital-to-analog conversion section is image data $[[;]]$ ,  
and

~~wherein~~ the apparatus further includes an image display section ~~for displaying~~ configured to display an image due to the analog data.

Claim 33 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 30, wherein

analog data output from the digital-to-analog conversion section is audio data $[[;]]$ , and  
~~wherein~~ the apparatus further includes an audio output section ~~for outputting~~ configured to output an audio due to the analog data.

Claim 34 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 1, wherein ~~image data is received at~~

the receiving section is configured to receive image data,  
~~wherein~~ the apparatus further includes an orthogonal transformation section ~~for obtaining~~ configured to obtain a conversion coefficient by performing orthogonal transformation on image data of each of the blocks obtained by dividing the image data received at the receiving section into two-dimensional blocks and a quantization section ~~for~~

~~quantizing~~ configured to quantize the conversion coefficient of each of the blocks supplied from the orthogonal transformation section[[;]],

~~wherein~~ the signal-deteriorating factor generation section includes:

a block information generation section ~~for generating~~ configured to generate block information indicative of a block whose conversion coefficient of a high-range frequency domain is to be removed; and

a range information generation section ~~for generating~~ configured to generate range information indicative of a range of the high-range frequency domain[[;]], and

~~wherein~~ the data-encoding section includes a conversion coefficient removal section ~~for removing~~ configured to remove a conversion coefficient of a high-range frequency domain indicated by the range information generated by the range information generation section, in a block indicated by the block information generated by the block information generation section, on the side of an input or an output of the quantization section.

Claim 35 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 34, wherein the orthogonal transformation is a discrete cosine transform.

Claim 36 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 34, further including a range-varying section ~~for varying~~ configured to vary a range of the high-range frequency domain.

Claim 37 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 34, wherein the block to be removed is selected alternately in at least one of a horizontal and a vertical direction ~~directions~~.

Claim 38 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 34, further including an encoding section ~~for performing~~ configured to perform variable-length encoding on quantized data in each block from the quantization section.

Claim 39 (Currently Amended): An apparatus for encoding data, the apparatus comprising:

receiving means for receiving the data;

signal-deteriorating factor generation means for generating a signal-deteriorating factor in the received data based on the received data, the signal-deteriorating factor generation means including means for phase-shifting the received data; and

data-encoding means for obtaining encoded data by performing encoding processing on the data in which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, the data-encoding means including means for sub-sampling the data phase-shifted by the means for phase-shifting.

Claim 40 (Currently Amended): A method for encoding data, the method comprising:

a data-receiving step of receiving the data;

a signal-deteriorating factor generation step of generating a signal-deteriorating factor in the received data based on the received data; and

a data-encoding step of obtaining encoded data by performing encoding processing on the data in which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, wherein the signal-deteriorating factor generation step includes shifting a phase of the received data, and the data-encoding step includes sub-sampling the phase shifted data.

Claim 41 (Currently Amended): The method for encoding the data according to claim 40, wherein

analog data is received in the data-receiving step[[]],

~~wherein~~ the method further comprises an analog-to-digital conversion step of converting the received analog data into digital data[[]],

~~wherein~~ the signal-deteriorating factor generation step includes a phase-shifting step of shifting a phase of the converted digital data[[]], and

~~wherein~~ the data-encoding step includes an encoding step of encoding the digital data whose phase is shifted.

Claim 42 (Currently Amended): The method for encoding the data according to claim 40, wherein

digital data is received in the data-receiving step[[]],

~~wherein~~ the signal-deteriorating factor generation step includes a phase-shifting step of shifting a phase of the received digital data[[]], and

~~wherein~~ the data-encoding step includes an encoding step of encoding the digital data whose phase is shifted.

Claim 43 (Withdrawn - Currently Amended): The method for encoding the data according to claim 40, wherein

digital data is received in the data-receiving step[[]],

~~wherein~~ the signal-deteriorating factor generation step includes a blocking step of performing blocking on the received digital signal accompanied by shuffling in such a predetermined pattern as to reduce a correlation between adjacent items of data[[]], and



~~wherein~~ the data-encoding step includes a block-encoding step of obtaining an encoded digital signal by performing block-encoding on data of each of the blocks obtained by the blocking step.

Claim 44 (Withdrawn - Currently Amended):. The method for encoding the data according to claim 40, further comprising an extraction step of extracting data from a predetermined range of the received data, wherein

~~wherein~~ the data-encoding step includes:

a first detection step of detecting a maximum value and a minimum value of the extracted data;

a second detection step of detecting a dynamic range of the extracted data based on the detected maximum value and minimum value;

a generation step of generating minimum value-removed data by subtracting the detected minimum value from the extracted data; and

an encoding step of obtaining encoded data by quantizing the generated minimum value-removed data in a quantization step determined in accordance with the detected dynamic range $[[;]]_s$  and

~~wherein~~ the encoding step includes the signal-deteriorating factor generation step of performing quantization in a condition where a quantization step in at least one of regions on the maximum value side and the minimum value side is made larger than quantization steps in other regions.

Claim 45 (Withdrawn - Currently Amended): The method for encoding the data according to claim 40, wherein

image data is received in the receiving step $[[;]]_s$ ,

~~wherein~~ the method further comprises:

an orthogonal transformation step of obtaining a conversion coefficient by performing orthogonal transformation on the image data of each of the blocks obtained by dividing the received image data into two-dimensional blocks; and

a quantization step of quantizing the conversion coefficient of each of the blocks obtained by the orthogonal transformation step[[;]],

~~wherein~~ the signal-deteriorating factor generation step includes:

a block information generation step of generating block information indicative of a block whose conversion coefficient of a high-range frequency domain is to be removed; and

a range information generation step of generating range information indicative of a range of the high-range frequency domain[[;]], and

~~wherein~~ the data-encoding step includes a conversion coefficient removal step of removing a conversion coefficient of a high-range frequency domain indicated by the range information generated by the range information generation step, in a block indicated by the block information generated by the block information generation step, before or after the quantization is performed in the quantization step.

Claim 46 (Currently Amended): An apparatus for encoding data, the apparatus comprising:

[[an]] a receiving section ~~that receives~~ configured to receive data into which a signal-deteriorating factor for deteriorating a signal is generated, the factor being generated by a signal-deteriorating factor generation section ~~for generating~~ configured to generate the signal-deteriorating factor by phase-shifting the data; and

a data-encoding section ~~that obtains~~ configured to obtain encoded data by performing encoding processing on the data into which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, the encoding processing including sub-sampling the data.

Claim 47 (Currently Amended): The apparatus for encoding the data according to claim 46, wherein

the receiving section ~~receives~~ is configured to receive a second digital signal that is obtained by sequentially performing encoding processing, decoding processing, digital-to-analog conversion processing that generates analog distortion, and analog-to-digital conversion processing on a first digital signal[[]],

~~wherein~~ the data-encoding section includes an encoding section ~~for obtaining~~ configured to obtain an encoded digital signal by performing encoding processing on the second digital signal which the receiving section receives[[]], and

~~wherein~~ a decoded digital signal obtained by decoding an encoded digital signal obtained by the encoding section has a larger degree of deterioration than a decoded digital signal obtained by performing encoding processing and decoding processing on the first digital signal.

Claim 48 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 47, wherein the encoding section includes:

a blocking section ~~for blocking~~ configured to block the second digital signal; and

a block-encoding section ~~for obtaining~~ configured to obtain an encoded digital signal by performing block encoding on data of each of the blocks obtained by the blocking section.

Claim 49 (Withdrawn): The apparatus for encoding the data according to claim 48, wherein the blocking is accompanied by shuffling in such a predetermined pattern as to reduce a correlation between items of data of adjacent positions contained in each of the blocks.

Claim 50 (Withdrawn): The apparatus for encoding the data according to claim 49, wherein the blocking is performed with items of data that are separate from the second digital signal by as much as a predetermined number thereof being made one block.

Claim 51 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 49, wherein the blocking is accompanied by ~~[[such]]~~ the shuffling as to reshuffle at least one suite of items of data in a block.

Claim 52 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 48, wherein the block-encoding section includes:

an orthogonal transformation section ~~for obtaining~~ configured to obtain a conversion coefficient by performing orthogonal transformation on data of each of the blocks obtained by the blocking section; and

a quantization section ~~for quantizing~~ configured to quantize the conversion coefficient of each of the blocks from the orthogonal transformation section.

Claim 53 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 52, wherein the orthogonal transformation is a discrete cosine transform.

Claim 54 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 52, wherein the orthogonal transformation is a discrete sine transform.

Claim 55 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 52, wherein the orthogonal transformation is a wavelet transform.

Claim 56 (Withdrawn - Currently Amended): The apparatus for encoding the data according to claim 48, wherein the block-encoding section includes:

a maximum value/minimum value detection section ~~for detecting~~ configured to detect a maximum value and a minimum value of data in a block;

a dynamic range detection section ~~for detecting~~ configured to detect a dynamic range of the data in the block according to the maximum value and the minimum value detected by the maximum value/minimum value detection section;

a generation section ~~for generating~~ configured to generate minimum value-removed data by subtracting the minimum value detected by the maximum value/minimum value detection section from the data in the block; and

an encoding section ~~for obtaining~~ configured to obtain an encoded digital signal by quantizing the minimum value-removed data generated by the generation section, by using a quantization step determined in accordance with the dynamic range detected by the dynamic range detection section.

Claim 57 (Withdrawn): The apparatus for encoding the data according to claim 47, wherein the analog distortion occurs when a high-frequency component is removed in the digital-to-analog conversion.

Claim 58 (Original): The apparatus for encoding the data according to claim 47, wherein the analog distortion occurs when a signal is shifted in phase in the digital-to-analog conversion.

Claim 59 (Original): The apparatus for encoding the data according to claim 47, wherein the digital signal is a digital image signal.

Claim 60 (Original): The apparatus for encoding the data according to claim 47, wherein the digital signal is a digital audio signal.

Claim 61 (Currently Amended): A apparatus for encoding data, the apparatus comprising:

receiving means for receiving data into which a signal-deteriorating factor for deteriorating a signal is generated, the factor being generated by a signal-deteriorating factor generation section for generating the factor and including phase-shifting the signal; and

data-encoding means for obtaining encoded data by performing encoding processing on the data into which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, the encoding processing including sub-sampling the data.

Claim 62 (Currently Amended): A method for encoding data, the method comprising:  
a receiving step of receiving data into which a signal-deteriorating factor for deteriorating a signal is generated, the factor being generated by a signal-deteriorating factor generation section for generating the factor and including phase-shifting the data; and

a data-encoding step of obtaining encoded data by performing encoding processing on the data into which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, the encoding processing including sub-sampling the phase-shifted data.

Claim 63 (Currently Amended): The method for encoding the data according to claim 62, wherein

in the receiving step, a second digital signal is received which is obtained by sequentially performing encoding processing, decoding processing, digital-to-analog conversion processing that generates analog distortion and analog-to-digital conversion processing on a first digital signal[[]],

~~wherein~~ the data encoding step includes an encoding step of obtaining an encoded digital signal by performing encoding processing on the second digital signal which is received in the input step[[]], and

~~wherein~~ a decoded digital signal obtained by decoding an encoded digital signal obtained by the encoding step has a larger degree of deterioration than a decoded digital signal obtained by performing encoding processing and decoding processing on the first digital signal.

Claim 64 (Currently Amended): An apparatus for outputting data, the apparatus comprising:

a data output section ~~that outputs~~ configured to output encoded digital data;  
a data decoding section that obtains decoded data by decoding the output digital data;  
a synchronization signal generation section ~~that generates~~ configured to generate a synchronization signal corresponding to the decoded data;

a signal-deteriorating factor generation section ~~that generates~~ configured to generate a signal-deteriorating factor promoting signal deterioration into the decoded data according to the decoded data; and

a synthesis section ~~that synthesizes~~ configured to synthesize data output from the signal-deteriorating factor generation section and the synchronization signal generated by the synchronization signal generation section, wherein

the signal-deteriorating factor generation section includes a phase-shifting section configured to phase shift the decoded data, and

the synthesis section is configured to sub-sample the phase-shifted data.

Claim 65 (Currently Amended): The apparatus for outputting data according to claim 64, wherein

~~the signal-deteriorating factor generation section includes a phase-shifting section for~~ shifting is configured to shift a phase of the synchronization signal generated by the synchronization signal generation section and a phase of the digital data output from the decoding section with respect to each other $[[;]]$ , and

~~wherein~~ the synthesis section ~~synthesizes~~ is configured to synthesize the synchronization signal whose phase is shifted respectively by the phase shifting section and the digital data.

Claim 66 (Currently Amended): The apparatus for outputting data according to claim 65, wherein the data output section ~~reproduces~~ is configured to reproduce the digital data from a recording medium and to output ~~outputs~~ it.



Claim 67 (Currently Amended): The apparatus for outputting data according to claim 65, further comprising a digital-to-analog conversion section ~~for converting~~ configured to convert the digital data output from the synthesis section into analog data.

Claim 68 (Currently Amended): The apparatus for outputting data according to claim 65, wherein the ~~phase-shifting~~ phase-shifting section ~~fixes~~ is configured to fix a shift width of the phase.

Claim 69 (Currently Amended): The apparatus for outputting data according to claim 65, wherein the ~~phase-shifting~~ phase-shifting section ~~randomizes~~ is configured to randomize a shift width of the phase.

Claim 70 (Withdrawn): The apparatus for outputting data according to claim 65, wherein the encoded digital data is digital data obtained by performing encoding by use of sub-sampling.

Claim 71 (Withdrawn): The apparatus for outputting data according to claim 65, wherein the encoded digital data is digital data obtained by performing conversion encoding.

Claim 72 (Withdrawn - Currently Amended): The apparatus for outputting data according to claim 65, wherein

the encoded digital data is digital data obtained in the encoding section by performing encoding $[[;]]$ , and

~~wherein~~ the encoding section includes:

an extraction section ~~for extracting~~ configured to extract digital data from a predetermined range in digital data before being encoded;

a maximum value detection section ~~for detecting~~ configured to detect a maximum value of the digital data extracted by the extraction section;

a minimum value detection section ~~for detecting~~ configured to detect a minimum value of the digital data extracted by the extraction section;

a dynamic range detection section ~~for detecting~~ configured to detect a dynamic range of the digital data extracted by the extraction section, based on the maximum value detected by the maximum value detection section and the minimum value detected by the minimum value detection section;

a generation section ~~for generating~~ configured to generate minimum value-removed data by subtracting the minimum value detected by the minimum value detection section from the digital data extracted by the extraction section; and

a quantization section ~~for quantizing~~ configured to quantize the minimum value-removed data generated by the generation section, by using a quantization step determined in accordance with the dynamic range detected by the dynamic range detection section.

Claim 73 (Currently Amended): An apparatus for outputting data, the apparatus comprising:

data output means for outputting encoded digital data;

data decoding means for obtaining decoded data by decoding the output digital data;

synchronization signal generation means for generating a synchronization signal corresponding to the decoded data;

signal-deteriorating factor generation means for generating a signal-deteriorating factor that promotes signal deterioration into the decoded data according to the decoded data; and

synthesis means for synthesizing data output from the signal-deteriorating factor generation means and the synchronization signal generated by the synchronization signal generation means wherein

the signal-deteriorating factor generation means includes means for phase-shifting the decoded data, and

the synthesis means includes means for sub-sampling the data output from the signal-deteriorating factor generation means.

Claim 74 (Currently Amended): A method for outputting data, the method comprising:

a data output step of outputting encoded digital data;  
a data decoding step of obtaining decoded data by decoding the output digital data;  
a synchronization signal generation step of generating a synchronization signal corresponding to the decoded data;  
a signal-deteriorating factor generation step of generating a signal-deteriorating factor that promotes signal deterioration into the decoded data according to the decoded data; and  
a synthesis step of synthesizing data in which the signal-deteriorating factor is generated and the synchronization signal, wherein

the data output from the signal-deteriorating factor generation step includes a step of phase-shifting the decoded data, and

the synthesis step includes sub-sampling the data in which the signal-deteriorating factor is generated.

Claim 75 (Currently Amended): The apparatus for outputting data according to claim 74, wherein

~~the signal-deteriorating factor generation step includes a phase-shifting step [[of]]~~  
includes shifting a phase of the generated synchronization signal and a phase of the digital data obtained by decoding with respect to each other[[;]], and

~~wherein~~ the synthesis step synthesizes the synchronization signal and the digital data whose phases are shifted respectively.

Claim 76 (Currently Amended): A system for processing a signal comprising:

a receiving section ~~that receives~~ configured to receive encoded data;

a data-decoding section ~~that obtains~~ configured to obtain decoded data by performing decoding processing on the received encoded data;

a signal-deteriorating factor generation section ~~that generates~~ configured to generate a signal-deteriorating factor in the decoded data in accordance with the decoded data; and

a data-encoding section ~~that obtains~~ configured to obtain encoded data by performing encoding processing on the data in which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor,

wherein

the signal-deteriorating factor generation section includes a phase-shifting section configured to phase-shift the decoded data, and

the encoding processing includes sub-sampling the phase-shifted data.

Claim 77 (Currently Amended): The system for processing the signal according to claim 76, wherein

the encoded data received at the receiving section is an encoded digital signal and the data-decoding section ~~obtains~~ is configured to obtain a decoded digital signal by performing decoding processing on the encoded digital signal[[:]],

~~wherein~~ the signal-deteriorating factor generation section includes:

a digital-to-analog conversion section ~~for obtaining~~ configured to obtain an analog signal containing analog distortion by performing digital-to-analog conversion processing on the decoded digital signal obtained by the data-decoding section; and

an analog-to-digital conversion section ~~for obtaining~~ configured to obtain a digital signal by performing analog-to-digital conversion processing on the analog signal obtained by the digital-to-analog conversion section[[:]] ,

~~wherein~~ the data-encoding section includes an encoding section ~~for obtaining~~ configured to obtain an encoded digital signal by performing encoding processing on the digital signal obtained by the analog-to-digital conversion section[[:]], and

~~wherein~~ the encoding processing performed by the encoding section promotes deterioration in the encoded digital signal owing to an influence of the analog distortion on the digital signal.

Claim 78 (Currently Amended): A system for processing a signal comprising:  
receiving means for receiving encoded data;  
data-decoding means for obtaining decoded data by performing decoding processing on the received encoded data;  
signal-deteriorating factor generation means for generating a signal-deteriorating factor in the decoded data in accordance with the decoded data; and

data-encoding means for obtaining encoded data by performing encoding processing on the data in which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, wherein

the signal-deteriorating factor generation means includes means for phase-shifting the decoded data, and

the encoding processing includes sub-sampling the phase-shifted data.

Claim 79 (Currently Amended): An apparatus for processing a signal, the apparatus comprising:

a receiving section ~~that receives~~ configured to receive encoded data;

a data-decoding section ~~that obtains~~ configured to obtain decoded data by performing decoding processing on the received encoded data;

a signal-deteriorating factor generation section ~~that generates~~ configured to generate a signal-deteriorating factor in the decoded data in accordance with the decoded data; and

a data encoding section ~~that obtains~~ configured to obtain encoded data by performing encoding processing on the data in which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, wherein

the signal-deteriorating factor generation section includes a phase-shifting section configured to phase-shift the decoded data, and the encoding processing includes sub-sampling the phase-shifted data.

Claim 80 (Currently Amended): The apparatus for processing the signal according to claim 79, wherein

the encoded data that is received at the receiving section is an encoded digital signal and the data-decoding section ~~obtains~~ is configured to obtain a decoded digital signal by performing decoding processing on the encoded digital signal[[;]],

~~wherein~~ the signal-deteriorating factor generation section includes:

a digital-to-analog conversion section ~~for obtaining~~ configured to obtain an analog signal containing analog distortion by performing digital-to-analog conversion processing on the decoded digital signal obtained by the data-decoding section; and

an analog-to-digital conversion section ~~for obtaining~~ configured to obtain a digital signal by performing analog-to-digital conversion processing on the analog signal obtained by the digital-to-analog conversion section[[;]],

~~wherein~~ the data-encoding section includes an encoding section ~~for obtaining~~ configured to obtain an encoded digital signal by performing encoding processing on the digital signal obtained by the analog-to-digital conversion section[[;]], and

~~wherein~~ the encoding processing performed by the encoding section promotes deterioration in the encoded digital signal owing to an influence of the analog distortion on the digital signal.

Claim 81 (Withdrawn - Currently Amended): The apparatus for processing the signal according to claim 80, wherein the encoding section includes:

a blocking section ~~for blocking~~ configured to block the digital signal obtained by the analog-to-digital conversion section; and

a block-encoding section ~~for obtaining~~ configured to obtain an encoded digital signal by performing block encoding on data of each of blocks obtained by the blocking section.

Claim 82 (Withdrawn): The apparatus for processing the signal according to claim 81, wherein the blocking is accompanied by shuffling in such a predetermined pattern as to reduce a correlation between items of data of adjacent positions contained in each of the blocks.

Claim 83 (Withdrawn): The apparatus for processing the signal according to claim 82, wherein the blocking is performed with items of data that are separate from the digital signal obtained by the analog-to-digital conversion section by as much as a predetermined number thereof being made one block.

Claim 84 (Withdrawn - Currently Amended): The apparatus for processing the signal according to claim 82, wherein the blocking is accompanied by ~~[[such]]~~ the shuffling as to reshuffle at least one suite of items of data in a block.

Claim 85 (Withdrawn - Currently Amended): The apparatus for processing the signal according to claim 81, wherein the block-encoding section includes:

an orthogonal transformation section ~~for obtaining~~ configured to obtain a conversion coefficient by performing orthogonal transformation on data of each of the blocks obtained by the blocking section; and

a quantization section ~~for quantizing~~ configured to quantized the conversion coefficient of each of the blocks from the orthogonal transformation section.

Claim 86 (Withdrawn - Currently Amended): The apparatus for processing the signal according to claim 81, wherein the block-encoding section includes:



a maximum value/minimum value detection section ~~for detecting~~ configured to detect a maximum value and a minimum value of data in a block;

a dynamic range detection section ~~for detecting~~ configured to detect a dynamic range of the data in the block according to the maximum value and the minimum value detected by the maximum value/minimum value detection section;

a generation section ~~for generating~~ configured to generate minimum value-removed data by subtracting the minimum value detected by the maximum value/minimum value detection section from the data in the block; and

a quantization section ~~for obtaining~~ configured to obtain an encoded digital signal by quantizing the minimum value-removed data generated by the generation section, by using a quantization step determined in accordance with the dynamic range detected by the dynamic range detection section.

Claim 87 (Withdrawn): The apparatus for processing the signal according to claim 80, wherein the analog distortion occurs when a high-frequency component is removed in digital-to-analog conversion.

Claim 88 (Original): The apparatus for processing the signal according to claim 80, wherein the analog distortion occurs when a signal is shifted in phase in the digital-to-analog conversion.

Claim 89 (Original): The apparatus for processing the signal according to claim 80, wherein the digital signal is a digital image signal.

Claim 90 (Original): The apparatus for processing the signal according to claim 80, wherein the digital signal is a digital audio signal.

Claim 91 (Currently Amended): An apparatus for processing a signal comprising:  
receiving means for receiving encoded data;  
data-decoding means for obtaining decoded data by performing decoding processing on the received encoded data;  
signal-deteriorating factor generation means for generating a signal-deteriorating factor in the decoded data in accordance with the decoded data; and  
data-encoding means for obtaining encoded data by performing encoding processing on data in which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, wherein  
the data output from the signal-deteriorating factor generation means includes means for phase-shifting the decoded data, and  
the encoding processing includes sub-sampling the phase-shifted data.

Claim 92 (Currently Amended): A method for processing a signal comprising:  
a receiving step of receiving encoded data;  
a data-decoding step of obtaining decoded data by performing decoding processing on the received encoded data;  
a signal-deteriorating factor generation step of generating a signal-deteriorating factor in the decoded data in accordance with the decoded data; and  
a data-encoding step of obtaining encoded data by performing encoding processing on the data in which the signal-deteriorating factor is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating factor, wherein

the signal deteriorating factor generation step includes a phase-shifting step of shifting a phase of the decode data, and

the encoding processing includes sub-sampling the phase-shifted data.

Claim 93 (Currently Amended): The method for processing the signal according to claim 92, wherein

the encoded data that is received in the receiving step is encoded digital data and the data-decoding step is provided to obtain a decoded digital signal by performing decoding processing on the encoded digital signal[[;]],

~~wherein~~ the signal-deteriorating factor generation step includes:

a digital-to-analog conversion step of obtaining an analog signal containing analog distortion by performing digital-to-analog conversion processing on the decoded digital signal obtained by the data-decoding step; and

an analog-to-digital conversion step of obtaining a digital signal by performing analog-to-digital conversion processing on the analog signal obtained by the digital-to-analog conversion step[[;]],

~~wherein~~ the data-encoding step includes an encoding step of obtaining an encoded digital signal by performing encoding processing on the digital signal obtained by the analog-to-digital conversion step[[;]], and

~~wherein~~ the encoding processing performed by the encoding step promotes deterioration in the encoded digital signal owing to an influence of the analog distortion on the digital signal.

Claim 94 (Currently Amended): An apparatus for decoding data encoded by an encoding apparatus including a signal-deteriorating factor generation section that generates a

factor for deteriorating a signal including a phase-shift of the signal, the encoding apparatus configured to sub-sample the phase-shifted signal, the apparatus comprising:

a receiving section ~~that receives~~ configured to receive encoded data; and  
a data-decoding section ~~that obtains~~ configured to obtain decoded data by performing decoding processing on the received encoded data in accordance with the generated signal-deteriorating factor so as to promote signal deterioration.

Claim 95 (Withdrawn - Currently Amended): The apparatus for decoding data according to claim 94, the apparatus decoding an encoded digital signal in which a signal-deteriorating factor is generated and which is obtained by performing block encoding on data of each of the blocks obtained by performing blocking on a digital signal, the blocking being accompanied by shuffling in such a predetermined pattern as to reduce a correlation between adjacent items of data, wherein

~~wherein~~ the data-decoding section includes:

a block-decoding section ~~for performing~~ configured to perform block-decoding processing on the encoded digital signal; and  
an inverse blocking section ~~for performing~~ configured to perform de-shuffling and inverse blocking on the data of each of the blocks obtained by the block-decoding section.

Claim 96 (Withdrawn - Currently Amended): The apparatus for decoding data according to claim 94, the apparatus decoding encoded data in which a signal-deteriorating factor is generated and which is obtained by performing orthogonal transformation on image data of each of the blocks obtained by dividing the image data into two-dimensional blocks, performing quantization on a conversion coefficient of each of the blocks obtained by this

orthogonal transformation, and removing the conversion coefficient of a high-range frequency domain in a predetermined block before or after this quantization, wherein

~~wherein~~ the data-decoding section includes:

an inverse quantization section ~~for performing~~ configured to perform inverse quantization on the encoded data;

an inverse orthogonal transformation section ~~for obtaining~~ configured to obtain the image data by performing inverse orthogonal transformation on the conversion coefficient of each of the blocks from the inverse quantization section; and

a conversion coefficient interpolation section ~~for interpolating~~ configured to interpolate the conversion coefficient of the high-range frequency domain in the predetermined block by using the conversion coefficients of the high-range frequency domain of a block located in the vicinity of the predetermined block on the side of an input or an output of the inverse quantization section.

Claim 97 (Withdrawn - Currently Amended): The apparatus for decoding data according to claim 96, wherein

the encoded data is obtained by performing variable-length encoding on quantized data of each of the blocks obtained by the quantization $[[;]]_1$  and

~~wherein~~ the apparatus further comprises a decoding section ~~for performing~~ configured to perform variable-length decoding on the encoded data, on the side of the input of the inverse quantization section.

Claim 98 (Currently Amended): An apparatus for decoding data encoded by an encoding apparatus including a signal-deteriorating factor generation section that generates a

factor for deteriorating a signal including a phase-shift of the signal, the encoding apparatus configured to sub-sample the phase-shifted signal, the apparatus comprising:

receiving means for receiving the encoded data; and

data-decoding means for obtaining decoded data by performing decoding processing on the received encoded data in accordance with the generated signal-deteriorating factor so as to promote signal deterioration.

Claim 99 (Currently Amended): A method for decoding data encoded by an encoding method comprising a signal-deteriorating factor generation step that generates a factor for deteriorating a signal including a step of phase-shifting the signal, the encoding method including a step of sub-sampling the phase-shifted signal, the method comprising:

a receiving step of receiving the encoded data; and

a data-decoding step of obtaining decoded data by performing decoding processing on the received encoded data in accordance with the generated signal-deteriorating factor so as to promote signal deterioration.

Claim 100 (Withdrawn - Currently Amended): The method for decoding the data according to claim 99, the method decoding an encoded digital signal in which a signal-deteriorating factor is generated and which is obtained by performing block encoding on data of each of the blocks obtained by performing blocking on a digital signal, the blocking being accompanied by shuffling in such a predetermined pattern as to reduce a correlation between adjacent items of data, wherein

~~wherein~~ the data-decoding step includes:

a block-decoding step of performing block-decoding processing on the encoded digital signal; and

a deblocking step of performing de-shuffling and inverse blocking on the data of each of the blocks obtained by the block-decoding step.

Claim 101 (Withdrawn - Currently Amended): The method for decoding the data according to claim 99, the method decoding encoded data in which a signal-deteriorating factor is generated and which is obtained by performing an orthogonal transformation on image data of each of the blocks obtained by dividing the image data into two-dimensional blocks, performing quantization on a conversion coefficient of each of the blocks obtained by this orthogonal transformation, and removing the conversion coefficient of a high-range frequency domain in a predetermined block before or after this quantization, wherein

~~wherein~~ the data-decoding step includes:

an inverse quantization step of performing inverse quantization on the encoded data;

an inverse orthogonal transformation step of obtaining the image data by performing inverse orthogonal transformation on the conversion coefficient of each of the blocks obtained by performing the inverse quantization in the inverse quantization step; and

a conversion coefficient interpolation step of interpolating the conversion coefficient of the high-range frequency domain in the predetermined block by using the conversion coefficients of the high-range frequency domain of a block located in the vicinity of the predetermined block before or after performing inverse quantization in the inverse quantization step.

Claim 102 (Currently Amended): An apparatus for decoding encoded data, comprising:

a receiving section ~~that receives~~ configured to receive the encoded data;

a signal-deteriorating factor generation section ~~that generates~~ configured to generate a signal-deteriorating factor in the received encoded data in accordance with this encoded data; and

a data-decoding section ~~that obtains~~ configured to obtain decoded data by performing decoding processing on the data in which the signal-deteriorating factor is generated so as to promote signal deterioration in accordance with the signal-deteriorating factor, wherein

the signal-deteriorating factor generation section includes a phase-shifting section configured to phase-shift the encoded data, and

the decoding processing includes sub-sampling the phase-shifted data.

Claim 103 (Withdrawn - Currently Amended): The apparatus for decoding the data according to claim 102, the apparatus decoding an encoded digital signal obtained by performing block-encoding on data of each of the blocks obtained by performing blocking on a digital signal, the blocking being accompanied by shuffling in such a predetermined pattern as to reduce a correlation between adjacent items of data, wherein

~~wherein~~ the signal-deteriorating factor generation section includes:

a block-decoding section ~~for performing~~ configured to perform block-decoding processing on the encoded digital signal; and

a de-shuffling section ~~for de-shuffling~~ configured to de-shuffle data of each of the blocks obtained by the block-decoding section~~[[;]]~~, and

~~wherein~~ the data-decoding section includes an inverse blocking section for performing inverse blocking in accordance with the de-shuffled data.

Claim 104 (Withdrawn - Currently Amended): The apparatus for decoding the data according to claim 102, the apparatus decoding encoded data obtained by performing an



orthogonal transformation on image data of each of the blocks obtained by dividing the image data into two-dimensional blocks and quantizing a conversion coefficient of each of the blocks obtained by this orthogonal transformation, wherein

~~wherein~~ the signal-deteriorating factor generation section includes:

an inverse quantization section ~~for performing~~ configured to perform inverse quantization on the encoded data;

an inverse orthogonal transformation section ~~for obtaining~~ configured to obtain the image data by performing inverse orthogonal transformation on the conversion coefficient of each of the blocks from the inverse quantization section; and

a conversion coefficient acquisition section ~~for acquiring~~ configured to acquire the conversion coefficient of a high-range frequency domain in the predetermined block in accordance with the conversion coefficients of the high-range frequency domain of a block located in the vicinity of the predetermined block on the side of an input or an output of the inverse quantization section $[[;]]$ , and

~~wherein~~ the data-decoding section  $[[uses]]$  is configured to use the conversion coefficient of the high-range frequency domain in the block located in the vicinity of the predetermined block as the conversion coefficient of the high-range frequency domain in the predetermined block.

Claim 105 (Currently Amended): An apparatus for decoding encoded data, comprising:

receiving means for receiving the encoded data;

signal-deteriorating factor generation means for generating a signal-deteriorating factor in the input encoded data in accordance with the data obtained by decoding processing; and

data-decoding means for obtaining decoded data by performing decoding processing on the data in which the signal-deteriorating factor is generated so as to promote signal deterioration in accordance with the signal-deteriorating factor, wherein

the signal-deteriorating factor generation means includes means for phase-shifting the encoded data, and

the decoding processing includes sub-sampling the phase-shifted data.

Claim 106 (Currently Amended): A method for decoding encoded data, comprising:

a receiving step of receiving the encoded data;

a signal-deteriorating factor generation step of generating a signal-deteriorating factor in the input encoded data in accordance with this encoded data; and

a data-decoding step of obtaining decoded data by performing decoding processing on the data in which the signal-deteriorating factor is generated so as to promote signal deterioration in accordance with the signal-deteriorating factor, wherein

the signal-deteriorating factor generation step includes a step of phase-shifting the encoded data, and

the decoding processing includes sub-sampling the phase-shifted data.

Claim 107 (Withdrawn - Currently Amended): The method for decoding the data according to claim 106, the method decoding an encoded digital signal obtained by performing block encoding on data of each of the blocks obtained by performing blocking on a digital signal, the blocking being accompanied by shuffling in such a predetermined pattern as to reduce a correlation between adjacent items of data, wherein

~~wherein~~ the signal-deteriorating factor generation step includes:

a block-decoding step of performing block-decoding processing on the encoded digital signal; and

a de-shuffling step of de-shuffling data of each of the blocks obtained by the block-decoding step[[]], and

~~wherein~~ the data-decoding step includes an inverse blocking step of performing inverse blocking in accordance with the de-shuffled data.

Claim 108 (Withdrawn - Currently Amended): The method for decoding the data according to claim 106, the method decoding encoded data obtained by performing orthogonal transformation on image data of each of the blocks obtained by dividing the image data into two-dimensional blocks and quantizing a conversion coefficient of each of the blocks obtained by this orthogonal transformation, wherein

~~wherein~~ the signal-deteriorating factor generation step includes:

an inverse quantization step of performing inverse quantization on the encoded data;

an inverse orthogonal transformation step of obtaining the image data by performing inverse orthogonal transformation on the conversion coefficient of each of the blocks from the inverse quantization step; and

a conversion coefficient acquisition step of acquiring the conversion coefficient of a high-range frequency domain in the predetermined block in accordance with the conversion coefficients of the high-range frequency domain of a block located in the vicinity of the predetermined block on the side of an input or an output of the inverse quantization step[[]], and

~~wherein~~ the data-decoding step uses the acquired conversion coefficient of the high-range frequency domain in the block located in the vicinity of the predetermined block as the conversion coefficient of the high-range frequency domain in the predetermined block.

Claim 109 (New): An apparatus for encoding data, the apparatus comprising:

a receiving section configured to receive analog data;

an analog-to-digital conversion section configured to convert the analog data received at the receiving section into digital data;

a signal-deterioration generation section configured to generate a signal-deteriorating component in the digital data based on the digital data, the signal deterioration generation section including a phase-shifting section configured to shift a phase of the digital data; and

a data-encoding section configured to obtain encoded data by performing encoding processing on the digital data in which the signal-deteriorating component is generated so that signal deterioration may be promoted in accordance with the signal-deteriorating component, the data-encoding section including:

an encoding section configured to encode the digital data whose phase is shifted by the phase-shifting section;

an extraction section configured to extract a predetermined range of the digital data whose phase is shifted by the phase-shifting section;

a maximum value detection section configured to detect a maximum value of the digital data extracted by the extraction section;

a minimum value detection section configured to detect a minimum value of the digital data extracted by the extraction section;

a dynamic range detection section configured to detect a dynamic range of the digital data extracted by the extraction section, based on the maximum value detected by the

maximum value detection section and the minimum value detected by the minimum value detection section;

a generation section configured to generate minimum value-removed data by subtracting the minimum value detected by the minimum value detection section from the digital data extracted by the extraction section; and

a quantization section configured to quantizing the minimum value-removed data generated by the generation section, by using a quantization step determined in accordance with the dynamic range detected by the dynamic range detection section.